Volunteer Firemen

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Tarver Photo

Butane, a heavy liquefied petroleum gas, released by the breaking of a pipe connection from the tank shown, spread over streets and nearby buildings, taking fire from a trash burner 162 feet away. The burning jet of liquid gas from the tank is shown. This picture was taken just after two buildings had been blown up by explosions of the gas, three others set on fire, and five persons killed.

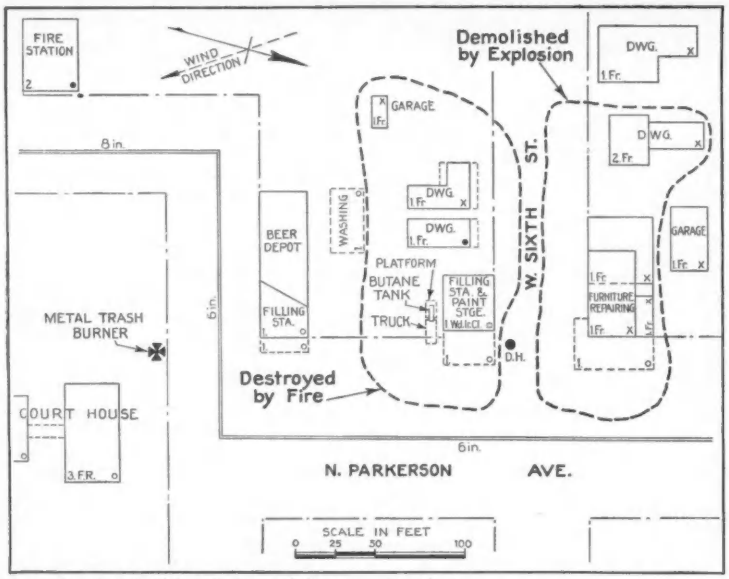
"Liquid" Gas Fire Kills Five

Widely Used Fuel Gas, Practically Odorless and Heavier Than Air, A New Life Hazard and Extra Problem for Fire Fighters

FIVE persons were killed, a house and a store were blown from their foundations and three other buildings were burned as the result of a fire of butane gas at Crowley, Louisiana, on October 22, 1936. This tragedy has focussed attention on the fire hazard of the family of "liquid" gases of which butane and propane are the commonest examples. Sold under a variety of trade names, these are petroleum products, produced in much the same manner as gasoline, and closely related to gasoline in fire hazard characteristics. The following description of the Crowley disaster based on the report of C. E. McCants, engineer of the Louisiana Rating and Fire Prevention Bureau, shows that the behavior of these gases makes them more dangerous than gasoline. The Crowley fire shows that the gases are not ones to trifle with, and that the fire department must know how to expect the gas to behave, if loss of life is to be avoided and the fire controlled.

Butane and propane gases are manufactured at oil distilleries. They are excellent gases for heating and cooking because of their high fuel value, and are coming into wide use, particularly in rural communities where city gas service is not available. They become liquids when compressed and so are usually handled in tanks under a moderate pressure. Pressures 75 to 200 pounds are common. On being released to the air, they become gases again. The gases can be handled without trouble if proper containers are used and those handling them are responsible persons who know enough to observe necessary safeguards.

At Crowley, a tank of about 600 gallons of liquefied butane gas had been brought to a filling station on a truck. The tank was a cylindrical steel one much like those commonly used for



From Report by Louisiana Rating and Fire Prevention Bureau

Diagram of the area affected by the explosion of butane gas at Crowley, Louisiana, October 22, 1936, in which five lives were lost.

storing water and other liquids. The practice was to drag the tank off the truck onto a temporary platform, a practice which is contrary to safety regulations for gasoline handling, and much more dangerous in the case of a tank under pressure. In the process, the discharge pipe and valve on one end of the tank were broken off. What followed shows the features of special danger of liquefied petroleum gases.

Unlike ordinary gases, these are heavier than air. When released they began to spread out along the ground, carried by the wind, and covered near-by streets and got into near-by buildings. Another point of hazard is the fact the gas is practically odorless, so does not give warning so that people can get out of its way. Negro workmen who had been unloading the tank asked a passing policeman to call the fire department. When he replied that he did not see any fire, the negroes said, "There ain't none yet, but there will be one pretty quick." The gas took fire when the fumes reached a trash burner 162 feet away.

The policeman had warned passing school children to get away from the area and persons living near by were ordered to get out of their houses. All buildings were vacated before the first explosion except a dwelling in back of the filling station. Five persons were trapped in this house and four were fatally burned. The fifth fatality was a negro man who was burned from the flash while passing along the street near by.

There were four distinct explosions when the gas vapors ignited and flashed back to the butane tank and near-by buildings. The last explosion, which occurred in the one-story frame mercantile building across the street from the filling station, was the most severe and could be heard for several miles. The fire department, assisted by the departments from the towns of Rayne and Eunice, soon had four hose streams in service. As shown by the diagram, the fire was confined to the filling station and two buildings in the rear which were completely involved immediately after the explosions. The mercantile building and a dwelling across West Sixth Street were demolished by the explosions.

Members of the National Fire Protection Association have had full information on liquefied petroleum gases for several years, so the hazards cannot be considered wholly new or unrecognized. The recommendations of the N.F.P.A. are contained in the following regulations, which are suitable for use in drafting local ordinances or state laws setting forth safety requirements: (1) Storage and Handling of Liquefied Petroleum Gases (design, installation and construction for containers and pertinent equipment); (2) Compressed Gas Systems (installation and operation of systems other than acetylene for lighting and heating); (3) Good Practice Requirements for Tank Trucks and Trailers for the Transportation of Liquefied Petroleum Gases. There is also information in a 1936 N.F.P.A. committee report dealing in a preliminary way with a new type of installation of butane gas plants and appliances in which gas is supplied from buried tanks on individual premises. All of these publications are available free on request to the N.F.P.A.

In fires where the gases are involved the only satisfactory method of extinguishment is to shut off the gas. In most installations valves are provided for this purpose at an accessible location.

While it may be possible to extinguish a gas flame by a well-directed hose or extinguisher stream, it is not ordinarily considered good practice to do so if the gas will continue to flow after the flame is out. An explosive mixture of the gas is more dangerous than the flame itself. It is better practice to use hose streams to protect exposures unless extinguishing the flame will make it possible to reach control valves and shut off the gas. This should only be done where there is adequate ventilation to carry off unburned gas without forming an explosive mixture. At Crowley, had the gas ignited immediately, before any had time to spread, the fire might have been confined to the tank only.

Fires in connection with the storage and handling of butane and propane in the liquid form are similar to gasoline fires. However, due to more rapid evaporation, the liquid would not be expected to flow long distances on the ground as in the case of gasoline. In event of fires around tanks, hose streams should be used to cool the tanks and prevent rapid evaporation.

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Oregon Coast Town Wiped Out by Conflagration

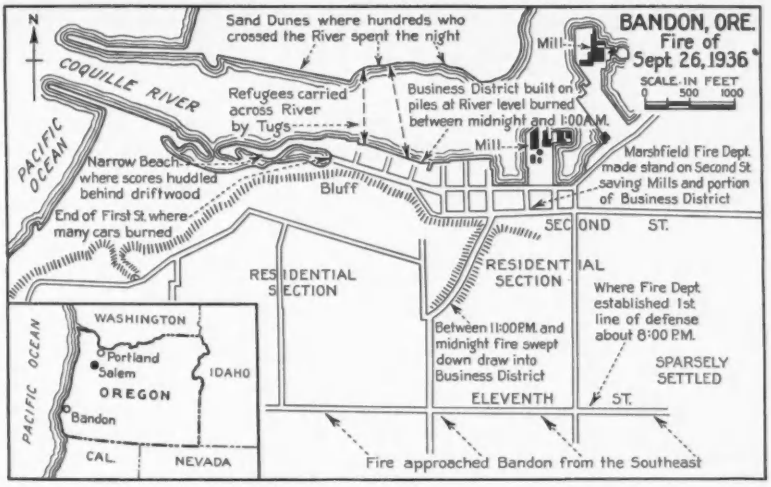
WHEN George Bennett, founder of Bandon, Oregon, brought from the Old Country the gorse or Irish hedge to ornament his new home, he little realized that sixty years later it would be largely responsible for the destruction of the town of 1800 inhabitants which occurred on September 26. The gorse, a prickly and very oily

shrub, is extremely combustible and is used for fuel in Europe. Admiring neighbors also planted it near their homes and it soon spread wild over the Bandon area. The rapid spread of the fire by means of the gorse bushes and wooden shingle roofs completely overtaxed the available fire fighting facilities. The loss was at least $1,250,000 and included the destruction of the business district and 400 dwellings. Eleven persons lost their lives.

CHIEF C. F. OTIS of Powers, Oregon, a neighboring town, has supplied an account of the fire which he obtained from Chief Woomer of Bandon and other chiefs who answered Bandon's call for help. This account has been supplemented by a report by the Oregon Insurance Rating Bureau.

On September 26 a brush fire, which had originated in slashings seven miles away, approached the town. The fire had been burning for several days without causing worry to the inhabitants, as it is common practice for farmers and stock men to burn their ranges. On this day, however, the temperature had reached 87 degrees and an east wind was blowing at a velocity of between 20 and 30 miles per hour. The humidity at noon was at the extremely low point of 8 per cent. At this point, anything combustible will ignite and burn easily.

The Bandon fire department had several calls during the day to grass and brush fires. The department consisted of a chief and 28 call men and was equipped with a 500 gallon pumper and a combination chemical and hose truck. Alarms came more frequently, and by evening the department was out all of the time. Until 8 o'clock P.M. the safety of the town was not considered seriously menaced. At 9 o'clock P. M. the first house was on fire and at this time Chief Woomer went to the local theatre and asked all able bodied men to fight the fire.



The fire was held in check along Eleventh Street on the outskirts of the town until 11 o'clock P.M., when help was called from adjoining cities. Marshfield responded with a 1,000 gallon pumper. Coquille and Myrtle Point sent hose.

The fire first destroyed the residential section and then spread into the business district. Within two hours, or by 1 o'clock, the town was almost completely destroyed. The residential section was on ground about fifty feet higher than the business district, which was largely built on piles along the Coquille River.

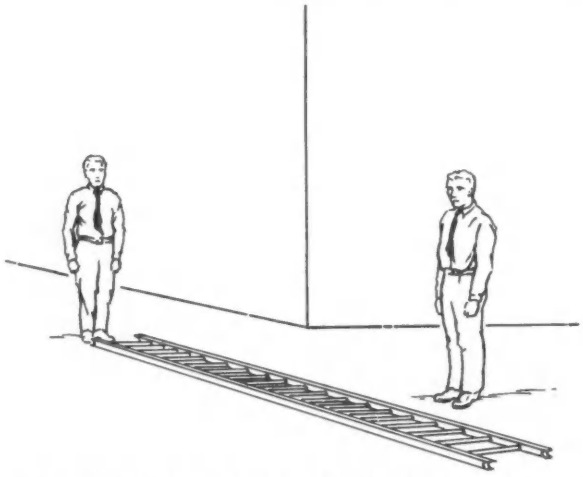
The water supply was adequate for a town of that size but was a low pressure system and pumpers were necessary for fire fighting. Nearby towns have high pressure water service and do not have fire department pumpers. When they went to Bandon they could not spread at hydrants but had to depend on two pumpers to fight a fire a mile long. Also due to the intense heat firemen were unable to shut off abandoned hydrants and water was lost through service connections in burned buildings. One of the two 10 inch redwood mains supplying the town was broken by the burning of a trestle. Charged hose lines burned and during the burning of the mercantile district the operator of the Bandon pumper was driven from the machine. The pump was left running, however, so as not to endanger the men manning the hose. One tire was burned off the apparatus but the pump and motor were not damaged. Some property in the business district was saved by three hose lines supplied by a harbor tug. Unfortunately the shearing of a pin on the tug's pump cut off the supply for these streams. Great credit is given to the Marshfield fire department for saving several business buildings and three industrial plants.

It is considered remarkable that no more than eleven lives were lost. Many citizens were driven out on the beach along the river where they were endangered by the burning of driftwood and automobiles driven on the beach to escape the fire. Other automobiles were burned on the bluff above the beach. At least 150 automobiles were damaged with an insurance loss of $50,000. Harbor vessels carried a large number of persons across the river to prevent their being trapped.

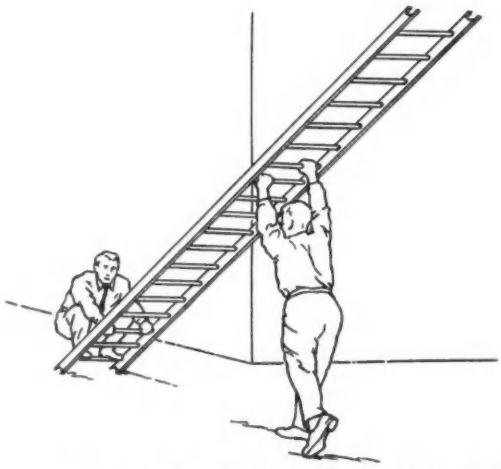
Portion of ruined business district of Bandon, Oregon following conflagration. Residential section was built on bluff shown at upper left.

Two-Man Flat Raise for Ladders

Practice Raising Short Ladders Develops Skill and Teamwork Among Company Members



To make the flat raise, the ladder is placed on the ground parallel with the building. The butt should be placed at the point where the ladder is to stand. One man stands at the butt and the other about one-third of the distance from the top.

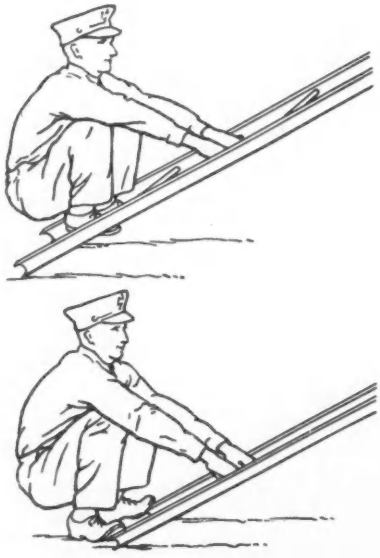


In raising, the man at the butt places feet on the bottom rung and hands on the third rung throwing his weight back. This assists the other man who lifts the ladder and walks toward the butt.

THE proper handling of ladders is not as simple as it may appear to the uninformed. The quickness required at fires to save lives and property comes only through much practice at some good method of ladder raising. Good teamwork is not desirable just for show purposes even though it does bring credit to any fire department. It is a protection to the firemen themselves and insures that the men will work together and that the possibilities of strains and injuries resulting from misjudging the weight of the ladder or poor handling will be avoided. In addition, practice under favorable conditions will give greater efficiency when working under hazardous conditions such as are experienced when fires occur in icy or stormy weather.

Many drillmasters consider that familiarity with short ladders is an important fundamental in developing good firemen. They insist that their men drill until they get the "feel" of the ladders and know instinctively how and where to lift a ladder and how to properly control its weight. Training with short ladders is an essential to the proper handling of long ladders.

The accompanying sketches were made possible through the courtesy of the fire department of Cambridge, Mass., members of which demonstrated the operation at the department drill tower. The text has been reviewed by Harry Rogers and James Just, fire department instructors of the Western Actuarial Bureau, and is consistent with practice recommended by the Fire Department Instructors' Conference. All of the illustrations show a twenty foot solid beam ladder. That size was chosen because it is a convenient one for two-man drill and is one of the short ladders used frequently at fires.

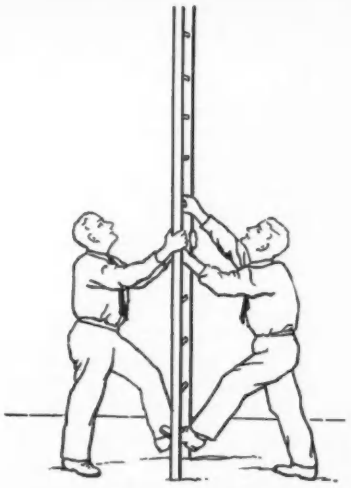


Two Methods of Butting a Ladder

The feet should be placed on the bottom rung with hands on the third rung as in upper drawing. Where lower rung is too high feet may be placed on end of beams with hands pulling on the second rung as in lower drawing.

Short ladders may also be raised on the beam by a procedure similar in general to that described for flat raising, but it is of less value as a practice maneuver because for longer and heavier ladders a flat raise is generally used. Methods of carrying ladders were described in VOLUNTEER FIREMEN, April 1936 issue.

The first part of the raising operation is to place the ladder in the proper position in respect to the building. The butt should be placed at the point where the ladder is to stand. It will usually be necessary to place the ladder parallel with the building because of space limitations and obstructions at the fire grounds such as overhead wires.



When the ladder is vertical or nearly vertical the butt man shown at the left of the drawing steps off with his right foot leaving his left foot on the lower rung to assist in pivoting the ladder. The top man may put one foot on the ladder if necessary as shown in the drawing to steady the ladder or slow down its momentum. The men watch the top of the ladder.

To turn the ladder so that it may be lowered against the building, it is pivoted on the beam nearest to the building. Before pivoting, the butt man grasps the beams with his hands and places his left foot on the lowest rung close to the beam on which the pivot is to be made. The top man stands with both feet on the ground and grasps the rungs. The ladder is tilted so that the outside beam is clear of the ground and is turned so that the butt man is between the ladder and building.

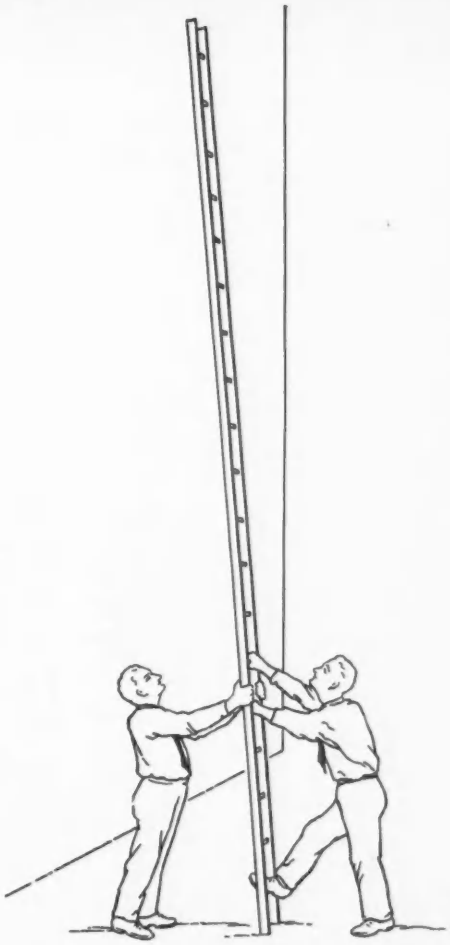
Where there is plenty of yard space about the building the ladder may be placed on the ground at right angles to the building which removes the necessity for pivoting the ladder when it is raised to vertical.

THERE are several rules for determining the distance at which the butt of the ladder should be placed from the building. However, for practical purposes all that need be remembered is to place the ladder five or six feet, or about the height of a man, from the wall where it is to be placed. Tall ladders may be placed a little further from the building and it is general practice to place solid beam ladders closer to the building than is necessary with the truss type ladders. In any event the place where the ladder is to be used must be considered and if there are projecting cornices their width must be added to the distance at which the butt of the ladder is placed from the wall.

In raising the ladder one man stands at the butt facing the top. The other man stands about one third of the distance from the top and faces the ladder. The man at the butt takes a position as shown in the drawings with his feet on the bottom rung or on the ends of the ladder beams and his hands on the second or third rungs. The other man lifts the ladder, steps under, and walks toward the butt pushing hand under hand on the rungs. When the ladder is vertical it is held steady as the men take positions to turn it.

In some departments the man lifting the ladder takes a position facing the top of the ladder before lifting and makes an about face while lifting the ladder from the ground.

Before the ladder is lowered against the building it must be turned or pivoted as shown in one of the illustrations so that its top is parallel with the building.



To complete the raising operation the ladder is lowered against the building or into a window as desired. The butt man continues to hold the beams of the ladder and the top man holds the rungs. The ladder is allowed to go against the building at a reasonable speed. The beam man places a foot on the ladder while the butt man keeps both feet on the ground. With extension ladders the tip is raised before the ladder is placed against the wall.

It is desirable in raising a ladder to have one of the men give the essential commands to insure teamwork. For a short ladder these would be "position" or "on the butt" to have the men take their positions, "raise" when the men are ready to raise the ladder, and "lower" when the ladder has been pivoted and is ready to be placed against the building. With ladders taller than the twenty foot ladder it is usually desirable to have one man stand back and give the commands, as he can watch its course and direct its placing.

Making the Fire Wait for Firemen

If Spread Through Stairways and Other Vertical Openings Can Be Delayed, the Man Fighting the Fire Has a Chance

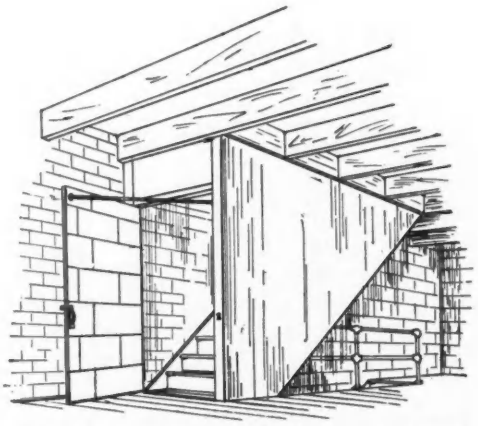
FIRE spreads from floor to floor of a building because there are stairways, hollow partitions and other vertical openings which offer a channel through which fire may pass. Many of our greatest fires have been the result of this defect in buildings which permits the fire to spread, and by avenues often concealed, so that the men fighting the fire cannot get there and get water on it before it has extended so far that the building is doomed. Not only does this rapid spread let the fire get away from fire fighters, but it often cuts off the escape of persons on floors above. People cannot very well come down a set of stairs while fire is coming up.

If this simple and fundamental fact about the behavior of fires was widely understood, architects and property owners would erect buildings so designed and constructed that a fire would have to burn for an appreciable time on the floor where it starts before it spreads to involve the rest of the building. When that is the case, the fire department has time to be notified, make the run and get its hose lines on the fire while it is small enough to control.

Last December in Moundsville, West Virginia, an open elevator shaft was responsible for the rapid spread of fire in a three-story hardware store which was completely destroyed with a loss of about $61,000. This fire was probably caused by an overheated furnace in the basement, and before the fire department was notified and upon the scene, the flames were breaking through the roof. Five nearby towns assisted the local fire department. Six hose streams were used.

Another typical case occurred recently in a three-story brick and frame hospital in Murray, Kentucky, when a fire started in a waste paper chute which was continuous from the basement to the attic. The alarm was delayed, and the fire spread so rapidly up the chute that the local part-paid fire department could not do much good with their three pumper streams. The property loss was about $66,000, but fortunately all of the 42 patients were removed before the fire cut them off from the exits. Had the fire been spreading through a stairway instead of the dumb waiter shaft, the story might have been different.

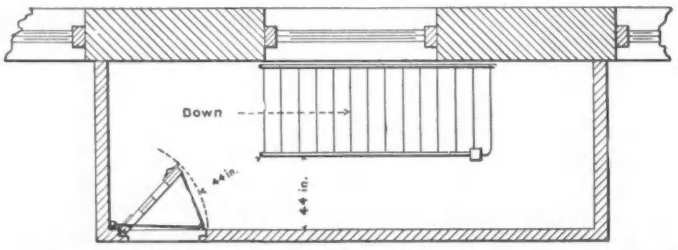
Fires like these will continue to lay waste millions of existing buildings in which when built no thought was given to the vertical spread of fire. These will continue to pile up the national loss totals because fire can spread readily through them. Some of the commonest avenues of spread are offered by open stairways, elevator and dumb waiter shafts, light wells, ventilating shafts and ducts, pipe holes, and holes in factory floors through which belts pass for the driving of machinery.



Enclosures of the type illustrated around stairways will stop the spread of fire from floor to floor. Double-matched boards make an inexpensive enclosure of this type which can be applied to existing buildings of combustible construction. This type of enclosure is not recommended where the stairways must serve as exits.

In dwellings, fires spread through hollow partitions. When the fire department rolls up to a dwelling fire and sees smoke coming out of an attic window or from under the eaves, some of the firemen go to the basement to look for the fire. This sometimes puzzles bystanders, but experience has taught firemen that most houses do not have firestopping in the walls and partitions and the smoke from the basement fire is going up through the openings between the inner and outer walls of the building, through hollow partitions or through the open space around the chimney.

Firemen inspecting dwellings or other buildings are often called upon for suggestions which will improve conditions without too great expense. There are inexpensive measures which can be taken in most buildings. For dwellings, board strips can be nailed in place around the basement ceiling which will delay the spread of fire into



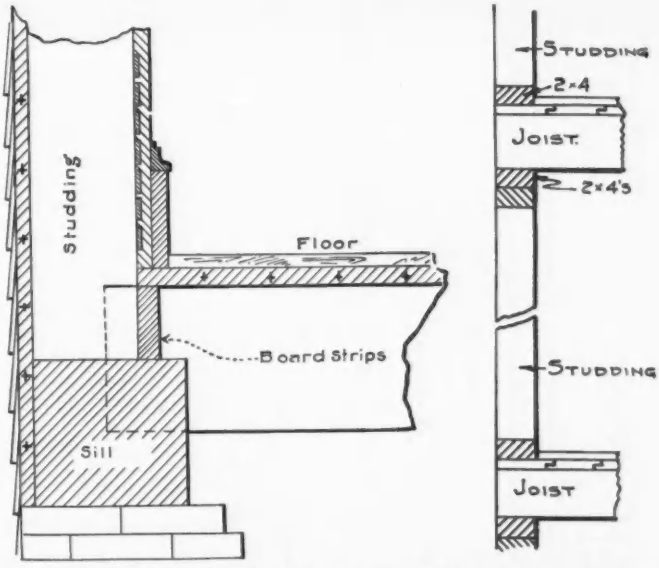
Plan of a satisfactory type of stair enclosure. A point to note is that the door does not swing into the enclosure so as to impede exit travel from floors above. The enclosure walls are usually made of brick, concrete, tile, gypsum block or similar masonry construction. Lighter fire retardant assemblies are also used. These are made of wood or metal frames supporting metal lath or gypsum wallboard on both sides, the whole covered with cement or gypsum plaster.

the hollow wall and partition openings. How this is done is shown in an accompanying illustration. Fully effective firestopping for wooden dwellings and other buildings can only be economically done during their construction, but the firestops at the basement level are a worthwhile and practical measure.

FIRES can be retarded in their spread from floor to floor by the erection of enclosures around stairways as shown in one of the accompanying illustrations. Even a light wood or sheet metal enclosure may stop fire long enough for the fire department to reach the scene. An enclosure of double matched boarding may hold a fire for a considerable time. These may be inexpensively built as shown in the illustration at the top of the opposite page.

That type of enclosure, while cheap and effective, offers no protection to occupants of the building, as a fire can cut off the use of such stairs as exits. If the stairway is completely enclosed, the spread of fire from floor to floor is thereby retarded, and the stairway may still be used as a means of exit. How this is done is shown in the plan at the bottom of the opposite page. Cities which have building laws usually require that such enclosures be of brick, concrete, gypsum block, tile, or similar masonry construction. Less effective, but a relatively inexpensive and practical type of enclosure is one in which an ordinary partition of wood, 2 in. by 4 in. wood studs, or a metal frame is used. The studs are covered with metal lath and cement or gypsum plaster, or an assembly of gypsum plaster on gypsum board. Such partitions plastered on both sides to the proper thickness (usually about ¾ in.), and otherwise properly constructed will stand up against a severe fire for an hour or more. In light-hazard occupancies where it is wished to avoid cutting off light from windows, stair enclosures of wired glass in metal frames are of considerable value as a firestop. They are somewhat less satisfactory than solid partitions because they permit radiated heat to pass, which reduces the value of the stairway as an exit.

In dealing with other openings, the procedure is the same as with stair enclosures. Ventilating ducts, elevator and other shafts require enclosures of the same fire-resistive character as for stairways. Openings for pipes and other openings wherever made during repair operations or the installation of equipment, must be filled up solid to prevent communication of fire. Hollow partitions in combustible buildings must be firestopped, preferably by incombustible material placed in the partitions at each floor level when the building is being built.



An inexpensive method of firestopping existing buildings of ordinary combustible wall construction. Board strips, nailed in the position shown at the basement ceiling level will retard spread of fire from the basement. Firestopping of 2 in. by 4 in. lumber may be also used at floor levels, but this is ordinarily costly unless done during construction of the building.

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Christmas Holiday Fires May Cause Serious Losses

FIVE people in one city, two in one home and three in another, were burned to death last Christmas Eve in fires starting from the use of candles on Christmas trees. Each year during this holiday season in the United States and Canada many lives are lost and homes are destroyed through carelessness with Christmas trees and their decorations.

The use of candles is very dangerous. The use of electric lighting units has decreased the candle hazard, but has introduced the electric hazard. A large part of the holiday fires in recent years has been due to short circuits in lighting units igniting combustible decorations. Where the wiring is in good condition, and where the bulbs are screwed tightly in their sockets, and where the bulbs are not placed too close to branches, wreaths, and other decorations, the danger of fire from this cause should not be great.

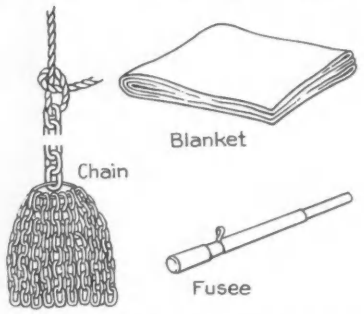
Several times before Christmas Day, fire departments that are on their toes advise their fellow townsmen about fire safety during the holidays. This is commonly done by seeing to it that warnings and safety precautions are placed in the local newspaper, putting on an inspection campaign in the shopping district, and similar means.

Fires during the coldest part of the year are more difficult to fight because of freezing of extinguishing appliances and also the hands and feet of firemen. These are additional incentives for extra efforts to prevent holiday fires.

Every possible effort should be made to encourage people to use non-combustible decorations and trimmings, instead of those made of paper, cotton, pyroxylin, or other material that is easily ignited by small sparks or heat. Asbestos wool, properly treated cotton, metal tinsel, and glass decorations and trimmings are safe to use.

Evergreen trees are highly flammable, especially when they have been allowed to become dry. By placing them in a pan of water or bucket of moist earth they will stay fresh longer and will be less subject to ignition and rapid spreading fires.

Fire Tools



Extinguishing Chimney Fires

THERE have been differences of opinion as to what method is the best for handling chimney fires and whether water should be used due to the fear of cracking the chimney while hot. Regardless of the method used in putting out the fire, however, the first thing to do is to make certain that it is confined to the chimney and has not extended to the building. Also before anything is put down the chimney it is essential to close or cover all chimney openings from which soot might get into the house and damage furnishings. If there is a fireplace a "fireproof" blanket may be useful in covering the opening but the mistake should not be made of using a salvage cover which will burn.

When a chimney fire is very hot, water is probably the most effective and cheapest extinguishing agent and either a chemical extinguisher or a booster line may be used. Care should be taken not to play a solid stream into a hot chimney. A spray should be used.

Where fires are not too severe a common method of controlling them is to knock down the soot. A useful equipment for this purpose is illustrated. It consists of about a dozen one-foot lengths of small chain wired together and tied to a rope. Such equipment is also useful for cleaning chimneys as a fire prevention measure if the flue is straight.

Soot may be knocked from the walls of a chimney by throwing sand, rock salt, baking soda or other inert matter down the chimney. Rock salt is a common ingredient in proprietary compounds sold for extinguishing chimney fires or cleaning chimneys.

Another type of chimney compound is designed to be tossed into the fire in a stove, heater or fireplace. For some of these compounds it is claimed that they give off a gas which smothers the fire in the chimney. Sulphur, thrown in the fire will produce a smothering gas. Fusees used by some fire departments operate on this principle as in burning they give off large volumes of smothering gas. For another group of compounds such as mixtures of salt and zinc, it is claimed that when burned they give off products which help to burn away the soot in the chimney. However, the mechanical methods of cleaning chimneys and putting out fires are generally effective.

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A Working Junior Fire Department

THE experience of Sebring, Ohio (1930 population 3,945), indicates that many communities might find it profitable to organize a junior fire department. Sebring has a regular volunteer fire department of 18 men. Its junior fire department numbers 22 boys, ages 17 to 21 years, and in effect provides an extra company for the department and is a source for the recruitment of new men. The adult company has a modern 600-gallon automobile pumper, while the boys use an older pumper, turned over to them when the new one was bought.

S. Trainer, secretary of the Sebring Fire Department, drills the boys and is largely responsible for their sustained interest. The youngsters are not content to hang around and wait for fires. Every one of them is given a complete course of training in hose and ladder operations, first aid, and other fire department work, and they practice regularly and religiously. A high standard of proficiency is insisted on.

At a regional fire school at Canton, Ohio, this summer, the Sebring Junior Fire Department crew put on a demonstration of hose and ladder work before over 2,000 firemen. More experienced firemen from the fire departments of the cities of Canton and Akron, which were also putting on a show, didn't look a bit better.

△ △ △ △ △

Problem Questions
FOR DECEMBER

Suggested for discussion at company and department meetings this month

51

What sort of record should be kept of each length of fire hose?

52

What policy should the fire department adopt for the safety of its men where fire operations require the handling of electrical power wires?

Watch for the answers in the next issue of VOLUNTEER FIREMEN

Discussion Subjects

49

Q. How may vertical openings in buildings be improved without great expense to prevent the rapid spread of fire from floor to floor?

A. By erecting enclosures around stairways and other vertical shafts, and by firestopping of hollow partitions. See article, page 6.

50

Q. What are some of the headings under which the causes of electrical fires may be classified?

A. The article on page 12 lists six general headings and refers to 140 subclassifications for electrical fire causes.

First Aid class of the Sebring, Ohio, Junior Fire Department, posed in front of their fire station.

If you are a fire commissioner, city manager, fire chief or fire department officer, or if you hold any other administrative position in your local government, or aspire to such position—

KEEP AHEAD OF YOUR JOB

by enroling in a Practical Correspondence Course in

FIRE ADMINISTRATION

A 600-page volume comes with the course and contains material never before found in print.

WHILE sponsored by city managers as a part of the in-service training program of their profession, here is a course which has a value to everyone who has anything to do with the direction or operation of a fire department. The problems of volunteer and part-paid fire departments, including such typical ones as those of equipment, rural water supplies, mutual aid and county organization are given equal attention with problems of the larger city fire department. Available nowhere else is the data included from more than 200 cities covering fire department personnel, stations, insurance costs and fire losses. The nominal fee of $25 for the course covers the above text (which the student may keep), the course of lessons, and personal review and correction of lesson papers.

Outline of Course in FIRE ADMINISTRATION

The Municipal Fire Problem.
Fire Insurance Classification of Cities.
Organization for Fire Protection.
Personnel Administration.
Water Supply for Fire Service.
Department Buildings and Equipment.
Distribution of Equipment and Personnel.
Fire Alarm Signaling Systems.
The Technique of Fire Fighting.
Legal Aspects of Fire Prevention.
Work of Municipal and State Fire Prevention Agencies.
Fire Investigation and Incendiarism.
Records and Measurement of Results.

Institute for Training in Municipal Administration
850 East 58th St., Chicago, Ill.

Please send me particulars and application form for the Course in Fire Administration. This does not obligate me to take the course.

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Address .....

(VF1236) .....

Making a Good Job of It

By Warren Kimball

In this column each month an experienced volunteer fireman discusses the handling of a typical fire. Readers are invited to describe fires which illustrate one or more principles of craftsmanlike fire fighting. (Names and places may be omitted.)

FIREMEN generally realize the importance of preventing unnecessary water losses and are instructed not to direct streams of water into smoke where no fire is visible. Frequently however streams used are larger than necessary. The usual hose stream discharges more than two hundred gallons of water a minute. Often, even with a brisk fire, not half of this amount is needed. Good judgment in the use of water is well illustrated by the following fire.

Fire started in rubbish under a small outside porch and stairs of a one and a half story frame dwelling. When the fire department arrived the porch and stairs were completely in flames, the frame exterior wall was burning, fire had entered the kitchen through an open door and a small amount of fire had entered the basement near the ceiling. The fire department upon arrival laid a 2½-in. line to control the fire on the outside of the house. At the same time a booster line was taken through the front door into the kitchen to stop the fire at that point. At no time was the play-pipe on the big line opened more than half way and care was taken not to direct the stream through the windows or door so as to cause damage in the house as the booster line was expected to control the inside fire. As soon as the main body of fire was knocked down a ¾-in. line was attached to the end of the large nozzle and was alternately taken in the basement to extinguish the small amount of fire there and used outside in overhauling. There was no unnecessary water used and no damage was done to portions not affected by the fire.

To complete the good handling of this fire, the overhauling was careful and thorough. Burned clapboards and insulating paper were removed from the exterior wall. The scorched wooden gutter was pried off and a burned window casing was removed so that no possible spark could escape notice. Such firefighting wins commendation.

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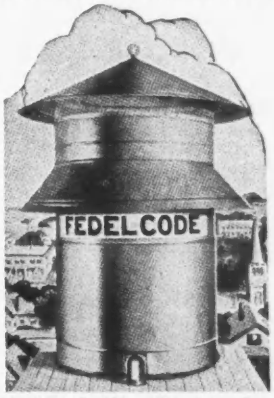
Can Be Heard for Miles
Calls Volunteers Instantly



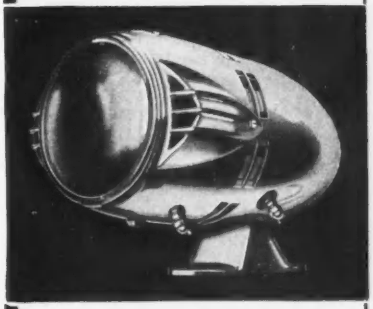
Federal Vertical Siren Mounted on Tower.

Approved by the National Board of Fire Underwriters.

Federal VERTICAL Sirens are most practical because

(1) They distribute sound in a wide range in all directions.
(2) Rugged in construction to withstand all kinds of abuse.
(3) Entirely weatherproof housing finished in Red Duco withstands sleet, rain, hail and dust storms.
(4) They are equipped with special high speed, ball bearing Federal Siren motors.

Write for Bulletin No. 55 for complete details.



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DOUBLE ACTION
SIREN
STREAMLINED
WITH FLASHING LIGHT AND A NEW TONE ROAR

CONSIDER THESE FEATURES:

- Streamlined beauty combined with rugged construction durability.
- A Siren Roar combined with Flashing Rays of Light.
- Greased sealed ball bearings aid ease of operation.
- Flashing light can be operated with siren roar or independently.
- FULLY chrome plated.
- Loudest by test . . . brightest warning light.

Write for Bulletin No. 54

FEDERAL ELECTRIC CO.
8717 So. State St. Chicago, Ill.

Volunteer Fireman

Professional Journal of the Volunteer Firemen's Section of the National Fire Protection Association

Published by the National Fire Protection Association, a voluntary non-profit organization, 60 Batterymarch Street, Boston, Massachusetts, U.S.A.

Volume 3 **December, 1936** Number 12

Let's Look at The Record With this issue of VOLUNTEER FIREMEN we complete its third volume, over three years of its life. It is worth while to take stock to see if the publication has a place in the sun, is meeting a demand. The cold circulation figures tell the story: In December 1933 we had 709 subscribers. In December 1934 we had 7,066! In December 1935 we had 9,123! In December 1936 we have 10,769!! What about the *total* circulation figures for the period? In December 1933 we issued 11,970 copies. In December 1934 we issued 19,002 copies. In December 1935 we issued 21,400 copies. In December 1936 we are issuing 25,014 copies. We believe that few new publications in any field can match this phenomenal growth. Nothing like it has ever been attempted before in the fire department field. Close to a million copies of VOLUNTEER FIREMEN have been printed and mailed since the first issue.

It seems to us that one of the major contributions to the volunteer fire service of the continent which VOLUNTEER FIREMEN has rendered has been to bring to those concerned with fire protection affairs a realization of the enormous scope and influence of the volunteer and part paid fire departments. Copies go, for instance, to all paid fire chiefs, to all state and provincial fire marshals, to firemen's training school officials and to insurance engineers and inspectors. VOLUNTEER FIREMEN has given to these individuals a new picture and a real appreciation of the service rendered by volunteer firemen everywhere. Such recognition should be of value to every volunteer fireman.

Publicity for Fire Problems The various articles in this and all issues of VOLUNTEER FIREMEN are very carefully written. This is so that the material may be clear, not only to the fireman who is familiar with the special terms of the fire business, but so that the material may have the widest possible value to any reader who may see the magazine, whether a fireman or not.

Of course the majority of articles are of principal interest to fire fighters. As often as possible however, we try to include stories which have a wider interest. The one on Making the Fire Wait for Firemen in this issue is, we think, of this sort. Many firemen will show this to their friends and neighbors showing them how easy it is to arrange their existing buildings so that the spread of fire can be retarded, and so that the fire department will have an even chance of stopping the fire.

Texaco Radio Program Attacks False Alarms Funnyman Eddie Cantor attacked the false alarm evil in a recent Sunday evening broadcast on the Texaco Fire Chief Gasoline Program. Over a nation-wide hookup he put across the fireman's angle on false alarms to millions of listeners, young and old, by means of a short dramatic sketch.

A 16-year old offender is brought before Cantor, as the Mayor and Chief Magistrate of "Texaco Town," charged with pulling a false alarm. As the hearing proceeds it develops that the false alarm caused an accident which has sent one fireman to the hospital. The injured fireman's wife rushes to Mayor Cantor as her husband lies hovering between life and death, providing opportunity for Cantor to confront the offender with the results of his action.

Many firemen who heard the broadcast have already written to the sponsor commending this feature of their Fire Chief Gasoline Program. Copies of the sketch will be sent to any reader of VOLUNTEER FIREMEN who did not happen to hear the program, but who will write to the Texas Company, 135 East 42nd Stret, New York, N. Y. We are glad to add our word of praise for this constructive effort in behalf of all fire departments. The false alarm is a nuisance in the sense that it causes needless wear and tear on men and apparatus. It is an evil not only because it takes away protection essential to the community during the time companies are out of quarters, but because of the possibility of accident and loss of life which accompanies every run of fire apparatus or other emergency vehicles.

Fire Truck Forgotten Because it was so long since a little railroad town in Arizona had a fire, they couldn't find the hose cart when flames broke out in a tourist camp. Commenting on this fire, the editor of *Safeguarding Arkansas Against Fire* says, "It is good practice to have fires few and far between, but not so good a practice to forget the fire fighting unit. Better to take it out occasionally, even if not needed for a fire, to brush it up and see that every part is in proper working order."

Where fire protection is everybody's business it is nobody's business. This occurrence would be impossible in any town having an active volunteer fire department holding regular meetings and practice drills at least once a month.

834 New Members and Renewals Last Month Since the last issue 187 firemen from nine fire departments or companies enrolled in the Volunteer Firemen's Section for the first time, and 647 men from 31 departments or companies renewed their memberships—making a total of 834 men from 40 departments. The nine new departments are listed below. The total membership of the section is now 10,769 firemen.

Eldridge Volunteer Fire Department, Eldridge, Iowa.

Bovey Fire Department, Bovey, Minnesota.

Vulcan Chemical and Hose Company, Lynbrook, New York.

Clatskanie Volunteer Fire Department, Clatskanie, Oregon.

Fredonia Volunteer Fire Department, Fredonia, Pennsylvania.

Yeadon Fire Company No. 1, Yeadon, Pennsylvania.

Consolidated Mining and Smelting Co., Ltd., Trail, British Columbia.

Campbellton Fire Brigade, Campbellton, New Brunswick.

Petrolia Fire Department, Petrolia, Ontario.

OPPORTUNITY FOR VOLUNTEER FIREMEN

In many localities in the United States we have openings for Fyr-Fyter Dealers which should be appealing to Volunteer Firemen because of their particular interest in fire fighting and Community Safety. Fyr-Fyter Dealers are (at the present time) earning more money than many merchants and manufacturers in their territories who have thousands of dollars invested in stock and are obligated to a regular weekly or monthly overhead covering rent, help, light, heat, etc.

If you are interested in creating a business for yourself (without the usual expense of such an undertaking), write to us. If your territory has no Fyr-Fyter Dealer or our representation is inadequate, we will be pleased to present to you our sales plans which enable you to become an independent merchant in your territory.

When writing, give fully your past business experiences and address your letter to

THE FYR-FYTER COMPANY
Dept. 20-12 DAYTON, OHIO

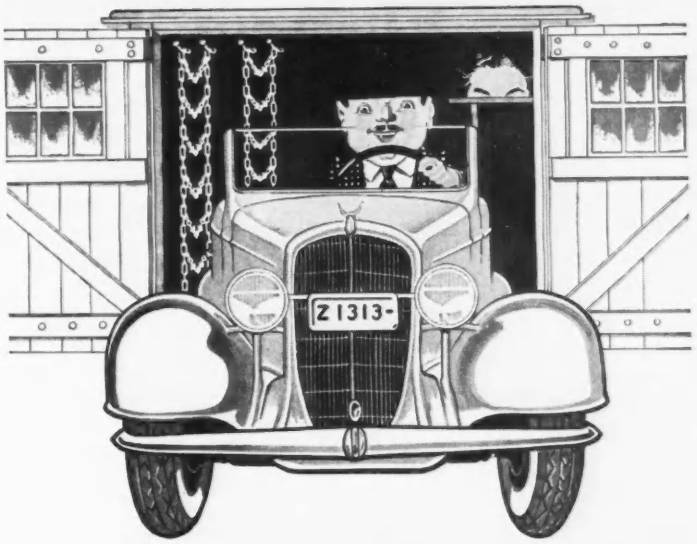
Membership Plan

VOLUNTEER FIREMEN'S SECTION
NATIONAL FIRE PROTECTION ASSOCIATION

WHERE twenty or more firemen in a volunteer company or department affiliate with the Volunteer Firemen's Section the cost is 50 cents a year *per man*. Each fireman will receive one copy of VOLUNTEER FIREMEN, the monthly journal of the Volunteer Firemen's Section, mailed regularly to his home address. The company or department automatically becomes a member of the National Fire Protection Association and is entitled to full privileges of membership. All the literature regularly issued to N.F.P.A. members is mailed to headquarters of the company or department.

Membership may be applied for by one member of the company or department collecting 50 cents for each of the 20 or more members and making a single remittance for the group, or the company or department may take a membership for its men and make a single remittance from the company or department treasury.

Because of the large amount of material mailed to members, not less than $10.00 can be accepted from any company or department for membership dues.



Don't Leave Them Behind!

Brains and Good Chains are Necessary for Safe Driving!

Your fire apparatus as well as your private cars should be Weed equipped for winter driving.

The quick start, the sudden stop, are impossible on slippery streets without tire chains. The best buy in tire chains is WEED American Bar-Reinforced. These are the chains that have cross bars double-welded to cross chains. This feature gives twice the mileage and twice the safety.

Ask your source of supply for WEED Americans.

AMERICAN CHAIN COMPANY, Inc.
Bridgeport, Connecticut

In Business for Your Safety

4 NEW MONEY-SAVING FEATURES THAT MORE THAN DOUBLE SAFE MILEAGE . . . .

1. Bar-Reinforcements double-welded to cross chains.
2. Hardened electric welded side chains.
3. Weed Patented Lever-Lock End Hooks.
4. Weedalloy—a tougher and harder chain metal.

Demand

WEED AMERICAN *Bar-Reinforced* TIRE CHAINS

MORE THAN DOUBLE SAFE MILEAGE

Licensed to manufacture and sell Bar-Reinforced Tire Chains under United States and Canadian Letters Patent: American Chain Co., Inc.; The McKay Co.; The Hodell Chain Co.; Pyrene Mfg. Co.; Dominion Chain Co., Ltd.; and Pyrene Mfg. Co. of Canada Ltd.

"Electric Wiring" Fires

International Association of Electrical Inspectors Lists One Hundred Forty Ways Such Fires Can Start

HOW often you have seen "short circuit" or "defective wiring" put down as the cause of a fire! Yet such designation of the cause of the fire is severely condemned by experienced electrical inspectors. And they have a good reason for it.

In a recent bulletin, George Welman, electrical engineer of the Louisiana Rating and Fire Prevention Bureau, stated the case when he issued a plea to the inspectors themselves to avoid such vague and meaningless terms. Engineer Welman explained that to be of value, the cause must be stated to tell exactly what happened, so that steps can be intelligently taken to see that the same set of circumstances do not again cause a fire.

Since 1897 there has been a National Electrical Code, a set of rules almost universally observed for safe electrical installations. Prepared by the N.F.P.A. Electrical Committee, new rules are added whenever the fire record shows the need of specifying safeguards against a condition which can cause fires. If this code is to be kept up to date, electrical fires must be accurately reported.

Electrical inspectors who have investigated many fires agree that it is sometimes difficult to decide between some possible cause, such as smoking, and an electrical cause. Examination of the electrical equipment and questioning of occupants as to conditions just before the fire may indicate the true situation.

The International Association of Electrical Inspectors has prepared a Manual for Investigating and Reporting Electrical Fires. In addition to general suggestions on procedure in investigation, a list of 140 causes of electrical fires is included. These 140 causes are subclassifications of six general types of electrical fire causes. The six embrace: those due to (a) an arc or spark; (b) overloading of wires, windings, or current carrying parts; (c) high resistance contacts; (d) conduits, armored or other metal wireways heated by the passage of electrical currents; (e) leakage of electrical currents through or over defective insulation; (f) careless handling of an electrically heated appliance, device, or lamp.

In every electrical fire the cause may be put under one of these general headings. With the appropriate subclassification you have a cause which accurately tells the story and provides a uniform basis of reporting.

How Classification of Electrical Fire Causes Is Used

The Manual for Investigating and Reporting Electrical Fires, prepared by the International Association of Electrical Inspectors (612 N. Michigan Ave., Chicago, 24 pp., copy free on request), lists 140 standard headings under which the causes of electrical fires may be accurately classified. For any one type of electrical equipment, not all of them would necessarily apply, but a typical example is shown:

Type of Electrical Equipment:

Wires of any approved wiring method for permanent stationary equipment, including wires of fixtures and drop cords.

Main Classification	Specific Cause of Fire	Identifying Number
ARCS OR SPARKS (Resulting from broken wires or connections).	Careless handling	9
	Corrosion as a result of moisture	10
	Corrosion as a result of acid or fumes	11
	Injury: Accidental after installation	12
	Injury: By mechanics when installed	13
	Injury: Resulting from ordinary service	14
	Manufacture defective	15
	Storm	16
	Terminal connection improperly made	17
	Terminal screws loose	18
	Unknown	19
	Vibration due to defective fastening	20
	Vibration due to location	21
INSULATION FAILURE (Of wires or windings).	Acid or acid fumes	98
	Heat from lamps	99
	Heat: Location excessively hot	100
	Injury: Accidental after installation	101
	Injury: Failure to use proper fittings	102
	Injury: By mechanics when installed	103
	Injury: As a result of ordinary service	104
	Manufacture defective	105
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	Moisture: Failure to make weatherproof	107
	Moisture: Due to condensation	108
	Moisture: Due to leaking roofs or piping	109
	Oil	110
	Tampering by incompetent persons	111
	Taping defective	112
	Unknown	113
	Vibration: Due to defective fastening	114
	Vibration: Due to location	115
	Water or other conducting liquid accidentally spilled	116
OVERLOADING (Of wires, winding or other current carrying equipment).	Automatic protection: Capacity of wire less than 15 amperes	131
	Automatic protection: In excess of capacity	132
	Careless handling	133
	Connections in error	134
	Locked rotor: Due to single phasing	135
	Locked rotor: Other than single phasing	136
	Switch mechanism on automatic control defective	137
	Unknown	138

"Approved" as used by electrical inspectors means that wiring methods conform to the rules of the National Electrical Code of the N. F. P. A., and that equipment has been tested and listed by Underwriters Laboratories, Inc.

The VITAGUARD Fire Alarm System

$4,000,000,000.00
Property Loss
100,000 Human Lives

The National Fire Loss for 10 years, 1926-1935 exceeded these figures.

Over 70% of the Fire Loss Occurred in Municipalities under 20,000 population.

THE regulations for the installation, maintenance and use of municipal fire alarm systems, as recommended by the National Fire Protection Association contain the following statement:

"It is generally recognized that there is no other thoroughly satisfactory means of sending and receiving fire alarms than an approved fire alarm telegraph system. Telephones should not be relied upon to replace needed boxes nor to supplement any inadequacy in number or location of boxes."

Fire Station Operating and Control Unit
Includes recording register, code signal transmitter, battery and charging equipment, testing and protection devices.

VITAGUARD
Street Signal Station
Provides protection against loss of alarms under disordered circuit conditions.

The salient features of the VITAGUARD Fire Alarm System are

Efficiency
Low Initial Cost
Nominal Maintenance Cost
Compactness
Rugged Construction
Simplicity

A complete line of public alarm equipment including the unsurpassed Diaphone Horn is associated with the Vitaguard Fire Alarm System.

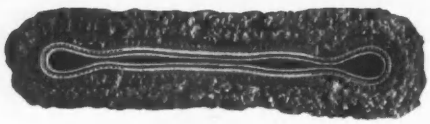
For information relative to this system address

Sales Promotional Department

THE GAMEWELL COMPANY

Newton Upper Falls, Mass.

BI-LATERAL FIRE HOSE



The hose which you can carry a full load to a fire (not three-quarters of a load).
When in the market, write us.

BI-LATERAL FIRE HOSE COMPANY
20 North Wacker Drive Chicago, Illinois

$10.00 Prize Can Be Yours

Enter Your Experience With Extinguishers For Award in Pyrene Prize Letter Contest

WINNERS of first and second prizes this month tell interesting experiences where their own lives and property were at stake at fires. Almost every reader of this magazine has seen the time when the prompt use of extinguishers of the right type have prevented serious losses.

Send in either your own or some other person's experience at a fire you know about. You may win one of the cash prizes offered in this contest cooperatively by the Pyrene Manufacturing Company of Newark, N. J., and VOLUNTEER FIREMEN.

FIRST PRIZE — $10.00

EARL H. MCCALL, *Driver,*
Fire Dept., Needles, California.

Three Lives at Stake

"I was out fishing one morning with two friends in a 16-foot motor boat. When we were out about a mile and a half from shore, we noticed smoke coming from the engine cabin. Three lives were at stake. One of my friends wanted to jump overboard and try to swim to the shore.

"On opening the door, we found that the whole cabin was on fire. I asked if there was a fire extinguisher on board, and was told that one hung in the cabin. We could not go inside to get it, but were able to reach it through the porthole. The fire had such a good start that I had to wrap wet sacks around my arm and cover my face in order not to get burned when reaching the extinguisher and applying its contents on the blaze. It was a 1-quart carbon tetrachloride extinguisher, but it sure did the work.

"The vibration of the engine had broken the gasoline line from the vacuum tank and the gasoline had run on the floor and in some way caught fire. Now there are two 1-quart carbon tetrachloride extinguishers on board and both are on the outside of the cabin —within easy reach in case of another fire."

SECOND PRIZE — $3.00

K. W. BELL, *Driver,*
Fire Department, Milo, Maine.

Two Extinguishers Save Home

"About six o'clock one morning in February when the temperature was around 30 degrees below zero, I awoke to find that the water pipes in the cellar of my home were frozen. (The cellar walls were made of 8-inch round posts standing on end close together.) I used a gasoline torch trying to thaw out the pipes. Then I left the house for about 20 minutes to report that I would be late for work. When I returned, my mother (who was alone in the house, and badly frightened) told me that the cellar was on fire. She had used all the water available, which was less than two gallons.

"Taking the 1-quart carbon tetrachloride extinguisher from our kitchen wall and telling my mother to get another one from the automobile in the garage, I went to the cellar. The blaze, which had been smouldering behind and between the posts, was now quite evident through the dense smoke. I used the contents of the extinguisher sparingly but effectively. I then broke out two cellar windows for ventilation and used about half of the other extinguisher to completely extinguish the fire. Evidently bark on the posts had ignited from my torch and had been smouldering for some time.

"This would have been a very serious fire had it not been for my two small extinguishers as there was a very high wind and the street on which I live had not been plowed that morning. This snow would have made it practically impossible for any motor equipment to get within one-half mile of my home."

THIRD PRIZE — $2.00

DOMINIC V. J. TUCCI,
Volunteer Fire Dept., Weston, W. Va.

Water Damage Avoided

"Our fire department was called to a residence in the center of our business section. Upon arriving, the chief found a serious blaze in a mattress. He immediately called for a 2½-gallon soda-acid extinguisher, and what would have been a bad fire, was quickly extinguished.

"Our department is prepared for every class of fire by having almost every type of fire extinguisher available. Had a hose line been used on this particular fire, considerable water damage would have resulted."

HONORABLE MENTION

FRED DOWDY, *Assistant Chief,*
Volunteer Fire Dept., Texas City, Texas.

JOHN W. TODD, *Engineer,*
Fire Dept., Oceanside, California.

CONTEST RULES

1. Contestants in the Pyrene Prize Letter Contest must be members of their local fire department.
2. Letters are to describe actual experiences where any approved fire extinguisher of any make has saved lives or property.
3. Trade names may be used but will be deleted in publication. Publishers reserve the right to edit winning letters to permit publication.
4. Each contestant automatically vouches for the truth of the facts presented from his own or others' experience.
5. Only one letter may be submitted each month.
6. Letters must be legibly written in ink or typewritten on white paper, one side only. Preference will be given to letters not over 250 words in length.
7. Letters received after the 8th of the month will be judged in following month's competition.
8. Monthly prizes in cash will be: 1st, $10.00; 2nd, $3.00; and 3rd, $2.00.
9. Address contest letter to Pyrene Prize Letter Contest, National Fire Protection Association, 60 Batterymarch St., Boston, Mass.

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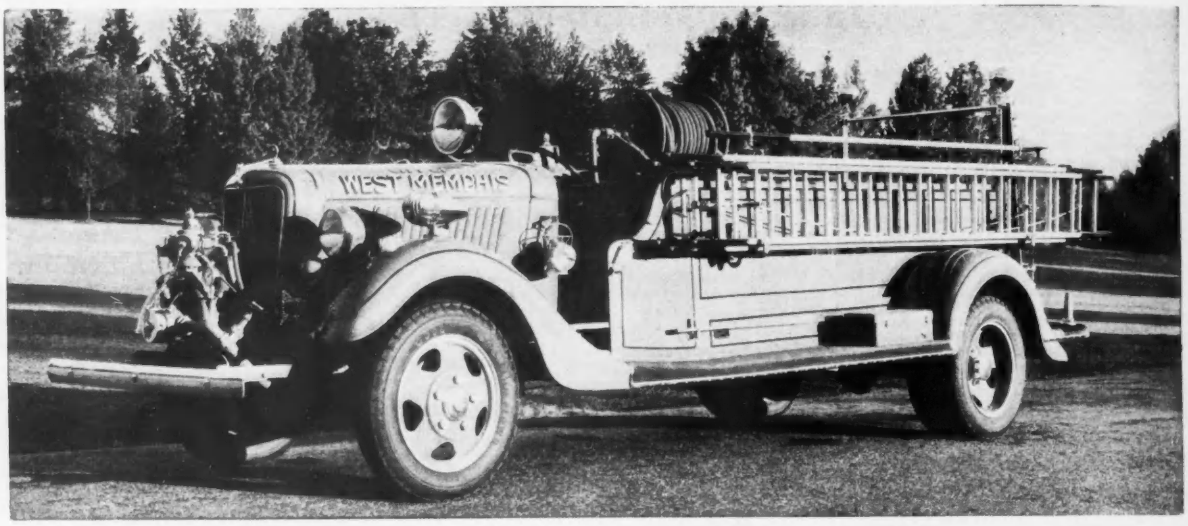

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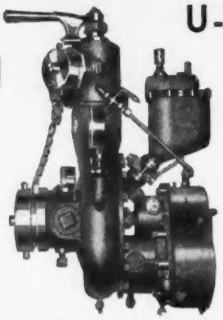

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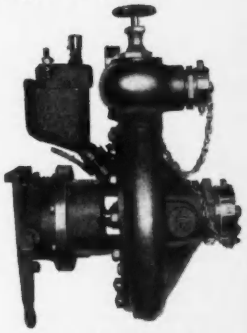

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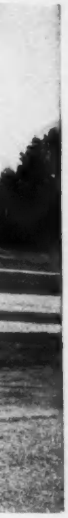

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